NIAG Study on Modelling and Simulation Support to Peace Support Operations (PSO)

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ABSTRACT

The central objective of this study sponsored by the NMSG was to identify practical, cost effective and realizable ideas to enhance NATO capabilities for managing the spectrum of Peace Support Operations by means of M&S. Planning, training and exercise, performing and analysis of employment in context with Peace Support Operations may be significantly improved (if not enabled) by the utilization of Modelling & Simulation (M&S). The mission space domain of Peace Support Operations enlarge the traditional Article V mission space. Several NATO nations have already study or simulation activities on M&S for PSO (Part of non-article-V operations for NATO or Operation Other Than War for US). An harmonization of the state-of-the art and an action plan for future NATO M&S capabilities was required in order to support NATO combined joint task forces on this new NATO tasks. This paper described the conclusions of the NIAG SG67 studies to identify the PSO M&S requirements and technical requirement issues to initiate NATO PSO M&S capabilities.

1.0 INTRODUCTION

The NIAG SG67 performed a prefeasibility study on Modelling and Simulation support to Peace Support Operations to define solutions and present a vision of a future simulation system addressing M&S systems for NATO and the Nations Peace Support Operations. This study – sponsored by the RTO/NMSG – will be followed by the Technical Activity Program (TAP) MSG-024/TG-017 of the NATO Modelling & Simulation Group (NMSG) to define the national contributions in accordance with a PATHFINDER "Vision" demonstrator.

The geopolitical changes, the new global economy, the population explosion, the food shortages, the climatic changes are just a few examples of threats which will require new military deployment. Rapid technological progress will contribute to in two aspects, one in facilitating the preparation and rehearsal of the potential scenarios, the other in providing an immediate feedback of the tactical events in the fields.

Internal or regional conflicts, threats by terrorists, radical political leaders, unstable regions and/or governments and natural/ environmental catastrophes may require diverse use of military forces. These uses are critical in their preparation and require multinational co-operations including the civil forces at the locations of conflict and worldwide. These uses of Forces are known by NATO bodies as: "Crisis Response Operations (CRO)". CROs fall into two categories:

- Peace Support Operations (PSO) and
- Other Security Interests (OSI).

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The focus of this study is mainly on Peace Support Operations. However, consideration has been given as well to some relevant aspects of OSI, namely in the area of acts of terrorism including missile and aircraft attacks with their potential catastrophic consequences on alliance members.

PSO are those operations where military and civilian personnel are normally involved, to implement arrangements relating to the prevention of conflicts, to the control of conflicts (cease- fire, separation of forces etc.), to the resolution of conflicts (partial or comprehensive settlements), and to establish and protect the delivery of humanitarian relief in situations of conflict.

2.0 PSO SIMULATION NEEDS AND MODELS REQUIREMENTS

In accordance with the NATO M&S Master Plan V1.0 [4], the following needs are identified:

- Education
  - PSO principles, ROEs, International Laws, multinational issues, …
- Training
  - E-Learning tools with study cases (Recce, Surveillance, Rescue, command chain with fire/non-fire decision and consequence, patrolling,…)
  - Pre-deployment: force generation, medical resources, administrative needs
- Exercise
  - Crisis Management & Planning/Force generation exercises
  - NATO/PfP Joint Combined Exercises in PSO context
  - Tactical training (FTX, CPX, CAX)
    - Co-operation with IO/NGO, CIMIC Training, ROEs
    - Urban Operations (MOUT)
- Operational support tools: Logistic, Course Of Actions & Planning
  - Force generation for PSO or Low intensity conflict
  - Support tools for logistic, personnel, medicine
  - Decision aids (Consequences of actions, alternative issues)

The AJP-3.4.1 [1] highlights military capabilities relevant to PSO. These military capabilities will be used as initial list of PSO model requirements:

- Maritime
  - Maritime Patrol (Cease-fire line, embargoes, piracy/contraband control, …)
  - Amphibious operations
  - Maritime support (evacuation, logistic, humanitarian resources, counter-mine)
  - Fire support (to forces ashore)
- Land
  - Armour (Reconnaissance, surveillance, fire power, protection, mobility, …)
  - Artillery (Fire location radar, UAV, counter-fire, guided munitions)
  - Infantry (site protection, patrol, check points, search ops, riot dispersion, …)
- Air
  - Reconnaissance & Surveillance (Fixed-wing, UAV, Satellite; ELINT/SIGINT)
  - Air Transport (Inter-theater & tactical for troops, medical, food, SF, …)

  - Control of the air (Counter-air, air protection, air blockade, traffic control, …)
  - Offensive Air power (high value assets, avoidance of collateral damage, …)
  - Helicopters (Air transport, reconnaissance, combat support)
- Joint logistic
  - NATO Logistics (accommodation, food, water, petroleum, medical, …)
- Joint Capabilities
  - Special Forces (liaison, reconnaissance, …)
  - Engineers (Power supply & distribution, construction, repair, camp construction for forces or refugees, ordnance disposal for mines, …)
  - NBC (decontamination, recce/survey, terrorist act protection of plants/labs…)
  - Medical (services to forces & indigenous population, hygiene recce, media impacts, veterinary services specially for dogs and for foods)
  - Multinational Specialized Units (Military Police, Military Provost Staff)
  - Intelligence (HUMINT, data collection, night observation, special air surveillance)
  - Psychological operations (use of radio & television newscasts, …)
  - Public affairs (political & diplomatic goals, media, NGO/PVO, …)

There are significant commonalities between Article V tasks and Peace Support Operation tasks, some tasks are common (manoeuvre, deployment, logistic, engineering…), some tasks are new (checkpoint, provide communication between parties, provide legal services…). Moreover, the situation could change rapidly between PSO situation and war situation. Some military force equipment is used both for PSO and War and military organisations have some commonality (e.g.: CJTF), so simulations should model both Article V and non-Article V operations.

In order also to minimise the M&S investments a reuse policy of Article V existing maritime, land and air models is recommended for Land, Maritime and Air simulations. Following features are expected to be necessary:

- Representation of multi-parties
- Asymmetric Rules of Engagements
- Low engagement (e.g.: non lethal weapons or small arms)
- Additional and/or more detail terrain database features (e.g.: urban areas, infrastructures, …)

3.0 TECHNICAL REQUIREMENTS

The present study is complement to the flagship PATHFINDER programme of the NATO Modelling and Simulation Group (NMSG). This programme is tied to the original M&S Master Plan (MSMP) which is the base plan underpinning PATHFINDER activities. Pathfinder aims to provide more effective exercising and training for the CJTF through the creation of federations of national models, integrated with decision support tools, to conduct Computer Assisted eXercises (CAX) at Strategic and Operational Levels seamlessly integrated with NATO CIS.

The use of federations composed of different national models may offer enhanced detail, fidelity and realism (sought by Operational Commands) to the monolithic simulations that are employed today. Federations provide greater fidelity in each of the Air, Land and Maritime domains and they also offer the possibility of dynamically linking families of models with different levels of resolution. This multi-

resolution approach enhances training value of the model and the ability to validate and improve NATO doctrine.

In order to identify potential PSO models, 3 sets of simulations and tools have been analyzed:

- Candidate PATHFINDER simulations : ABACUS, ALLIANCE (DUCTOR, STRADIVARIUS, WAGRAM), JCATS, JOANA (ALICE, HORUS, KORA, MEMO, SIMOF), JTLS, KIBOWI, SIACOM.
- Additional PSO models: AWARS, CATS, DEXES, DIAMOND, GESI, RAPHAEL/ABS-2000, SPECTRUM, TUTOR.
- Logistic, COA & Planning tools: ACROSS, ADAMS, COAST, COMPAS, GAMMA, SIAM, TOPFAS.

The main conclusions of this analysis are:

- No simulation and tool cover all the PSO requirements. They have a need for general purpose Art V with some non-art V capabilities and for Specific PSO area (PSYOPS, Urban operations, ….).
- They have a lack of common data model and model consistency. They have various data models and various level of granularity.
- They have a lack of CCIS interface. It is yet the case for conventional Art-V CCIS. For non-Art-V it is worst as PSO CCIS definition is just starting.

There is no CCIS specific data model for PSO; it is embedded within the Land C2 Information Exchange Data Model (LC2IEDM). Since the version 5.0 (which is the next standard to be published by ATCCIS at the end of the current phase, summer 2002), the LC2IEDM includes PSO requirements as asked by Operatives.

For initiate further M&S PSO the next steps are to:

1) Design first a M&S Reference Data Model. The work could start from LC2IEM V5.0, merge this data model with the NATO reference data model for joint operation, and extend also Air and Maritime data model for PSO to update this NATO reference data model. From the NATO reference data model, a scenario data model could be derived for M&S.
2) Continue this effort within the MIP in order to update the APP-9 standard. The AdatP-3 format is not very suitable for Simulation-CCIS exchanges (and CCIS interoperability remains an issue). XML technology should be more appropriate. Numerous PSO needs are also not addressed in the messages, so the data model has to be extend accordingly to the LC2IEM V5.0 for land or NATO reference data model for joint operations. This new APP-9 standard (format and data model) will be easier to integrate in the XML definition on the FOM accordingly with the HLA IEEE 1516 standard.
3) Make the FOM consistent with the CCIS Data Model. This problem has been identified by the SISO organisation, which has created the C4I Technical reference Model Subgroup. No international work is currently done on a reference FOM for operation and planning, except the work just starting with PATHFINDER. This work has to be complete and has to include also the PSO aspects.

Once these 3 steps will be achieved, and the level of effort to reuse legacy simulation for PSO and/or to develop new component will be estimated, a final tool selection could be perform in order to meet the simulation infrastructure defined for PATHFINDER applied to PSO needs.

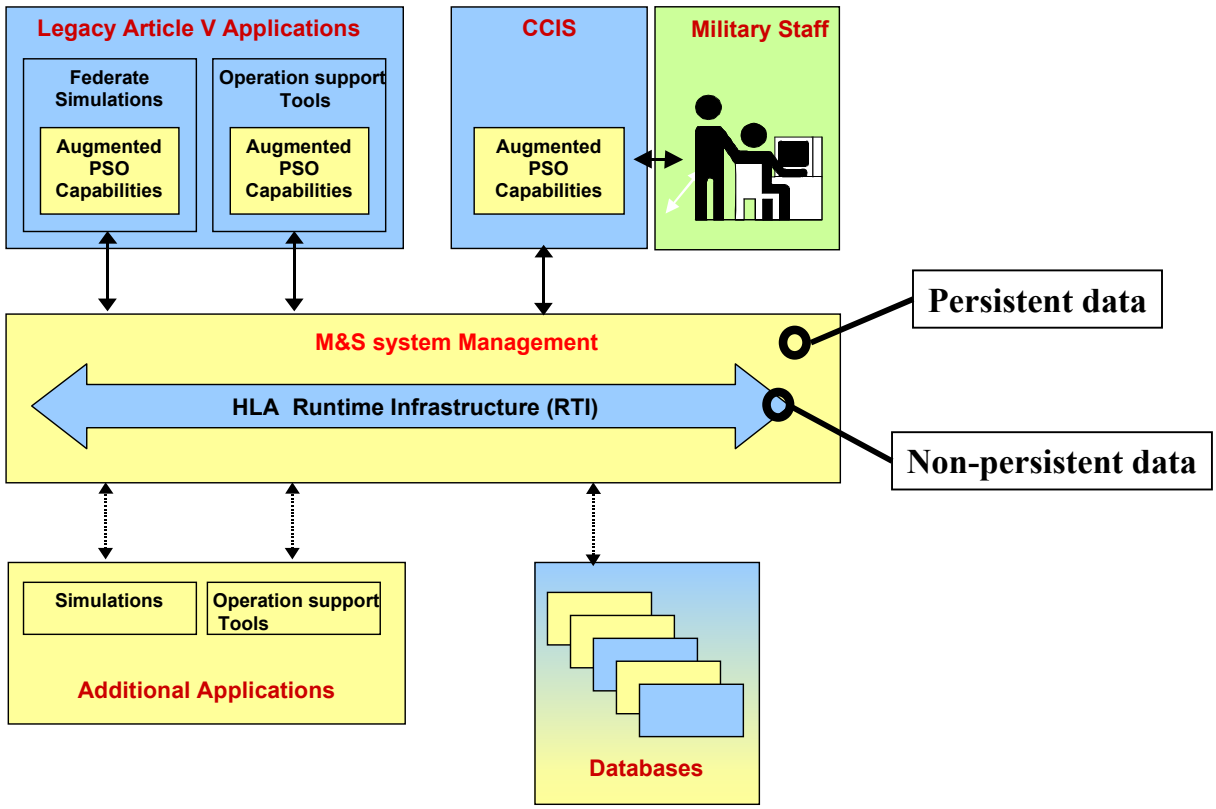

Figure 3-1: PATHFINDER vision of M&S Support to PSO Needs.

HLA techniques will be used to federate interactive application, once simulation database, operational support tool database and CCIS database will be aligned on a consistent scenario. A M&S system management will be required to exchange these "persistent data", versus the "non-persistent data" exchanged using the HLA techniques. The "non-persistent" data interchange techniques have to be defined (XML string exchanges based on CORBA mechanisms, database replication, etc.).

The architecture of such M&S support tool (see figure 3.2) is not specific to PSO applications and will be recommended as well for Art V applications. So, architecture development could start before to have completed the work on PSO data model. This architecture will include the M&S System, the CCIS system and the Simulation – CCIS interfaces.

Simulation-CCIS interface will be split in three categories of interface:

- Persistent data interface. A bridge will support the mapping between the CCIS data model and the simulations and tools data model (the reference data model will help the mapping process). This bridge will support also the existing CCIS data exchange mechanisms and the simulation data exchange mechanisms in order to reuse the simulation system in interface of the different NATO/National CCIS systems. On the simulation side SEDRIS should be the standard for environmental data interchange.
- Non-Persistent data interface. One or several bridges will support the mapping between CCIS message exchange or data link and the HLA federation. The FOM will be designed to support this mapping.
- Control interface. Further analysis is required to define this interface.

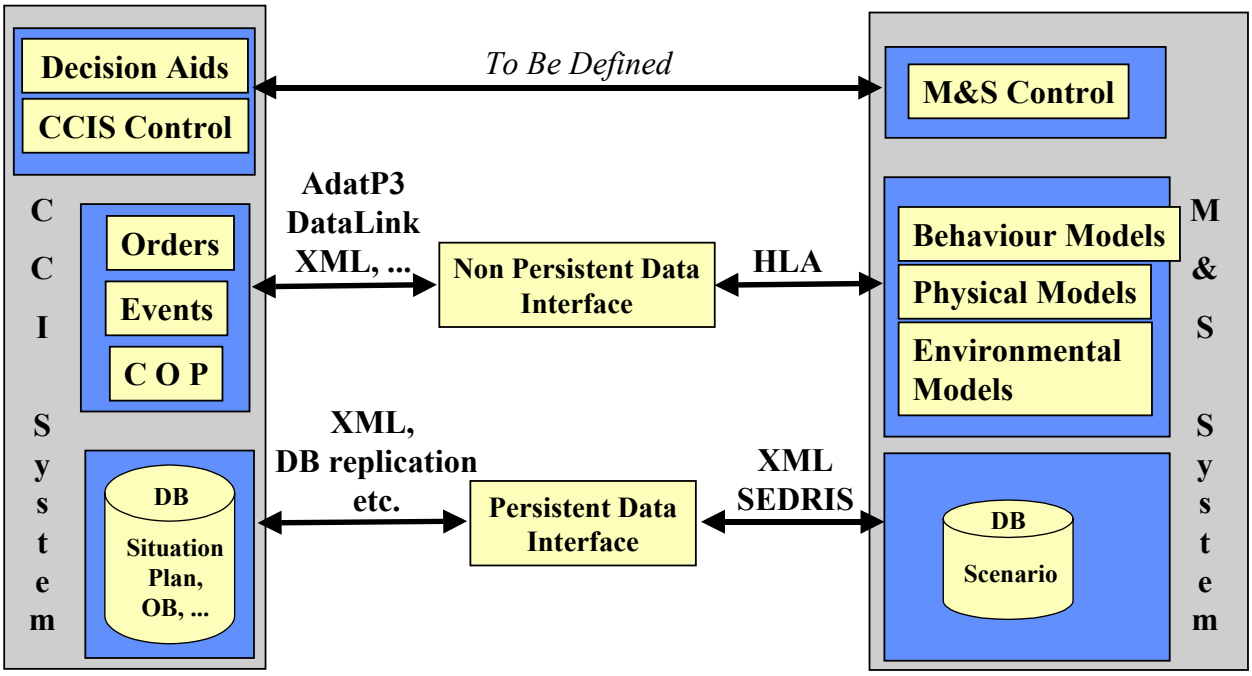

Figure 3-2: M&S Support Tool Architecture.

M&S system application will cover military exercises and operational support tools as defined in chapter 2.

4.0 M&S SYSTEM FOR COUNTER TERRORISM

As identified by the relevant RTO Ad Hoc group, M&S system for counter terrorism could be considered as a special application of the system described above. Nevertheless, the CCIS system change and the LC2IEDM data model is perhaps not appropriate, even if some commonality could be find, especially for Military Operation in Urban Terrain (MOUT).

M&S system for counter terrorism database will contain all Geographical Information concerning urban environment and vicinities: road, urban transportation, building, rivers, etc. Statistics information should include all information requested in crisis condition like: population density, traffics, building protections, smoke dispersion in function of weather conditions, etc.

Based on the information in the database, planning elements should contain:

- Potential Targets.
- Mediums (i.e.: all possible propagation ways of attack effects, following various scenario).
- Consequences (i.e.: direct risk and lateral effects).

Two different systems will use this database:

- The first one will help Crisis Management Leaders to react with a short reaction time.
- The second one will train civilian and crisis management workforce to react properly.

The first system (see figure 4-1) will be used in front of large high resolution screen, to allow all people to have the same view of the events. Users will be able in preparation phase to add features like potential

targets and mediums. They can create scenarios, test reactions and find new counter measures, all at a strategic level.

That system will be used in case of real terrorism attack in order to estimate:

- Terrorist movements capabilities. The system should include characteristics of terrorist structures and their transportation means. It will help to prevent other terrorist attacks or help to capture them.
- Human protection. Experience has shown that protecting workforce is very important. Such work means knowing where are the protective devices, how to distribute them, when and where to use them.
- Site recovery. A safety management system must be set up as soon as possible to do hazard monitoring, safety-equipment logistic and maintenance, site access control, health and safety monitoring, medical treatments. The safety management system can use all kind of available map (civil, military, from owner/operator), aerial photography, satellite imagery, statistical information to set up its database.

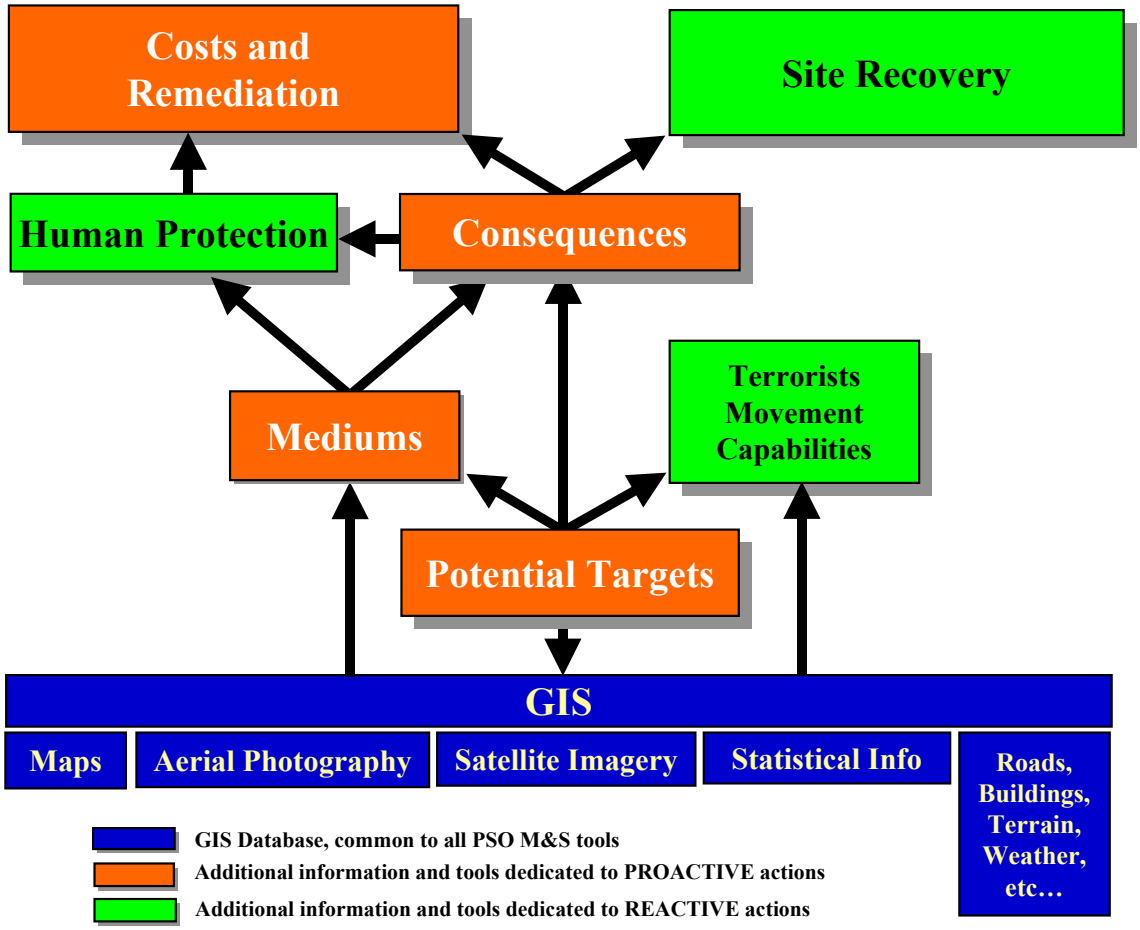

Figure 4-1: Counter Terrorism Operational Support Tools.

The second system (see figure 4-2) will be used to train and assess civilian and crisis management workforce with "real life" conditions, by using virtual reality. The virtual reality model will be extracted from the database, meaning that the database should contain, when available, as much as possible 3D

drawings of existing infrastructure. All the potential people involved in counter terrorism measure will be able to train in that environment, even together at the same time. The system will be very easy to use and will not require more than 5 minutes to be set up.

There are new virtual reality software coming on the market, able to handle polysoup (plain Computer Aided Design file) and massive models coming from GIS and AEC (Architecture Engineering and Construction) CAD software. By automatically converting these models, previously stored in the general database, it is possible to quickly create realistic environment where safety training can be carried out.

CROSSES (CROwds Simulation for Emergency Situations) is an example of simulation system using 3D views of « real » reconstruction of an actual urban environment in order to develop emergency plans.

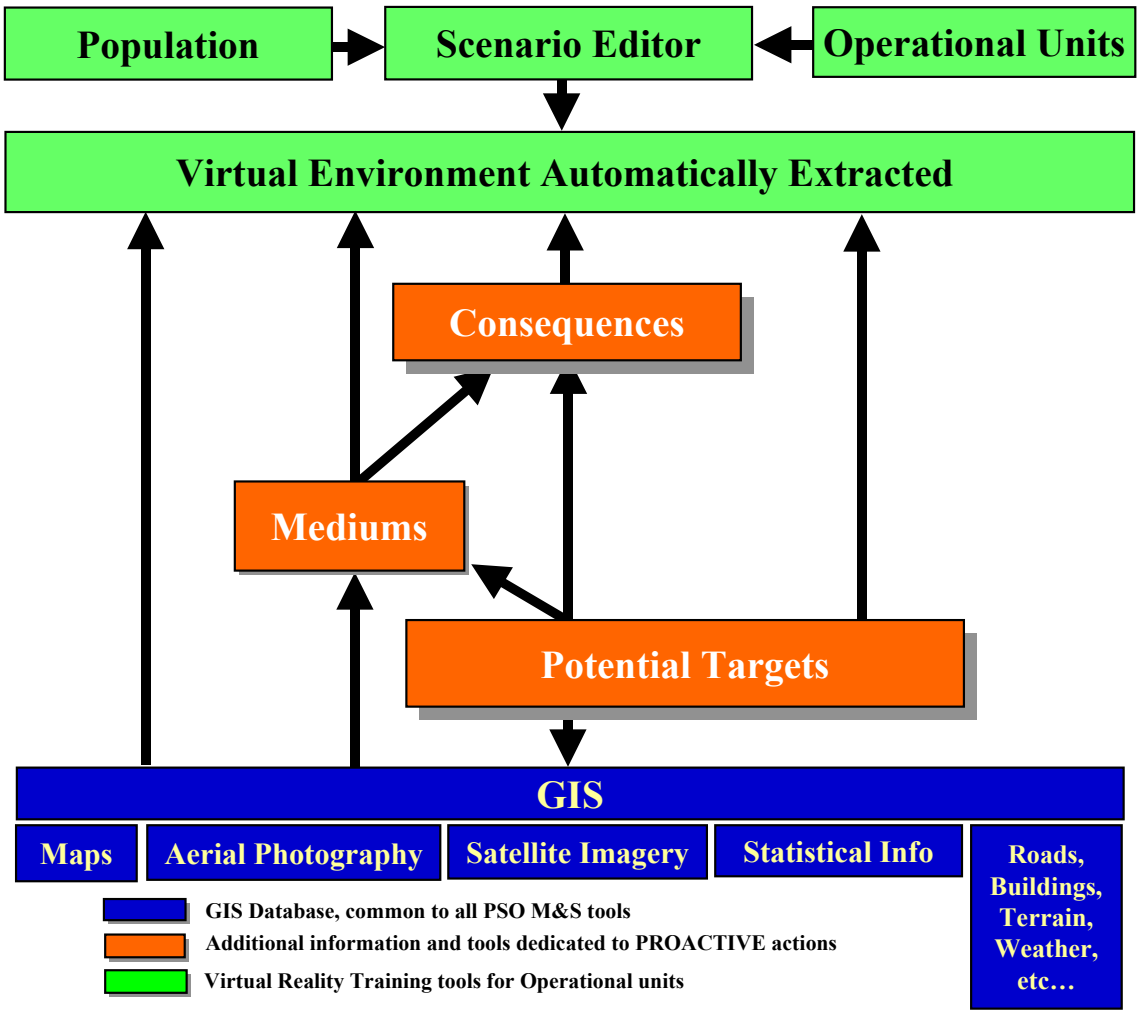

Figure 4-2: Training Version of the Counter Terrorism Support Tool.

Figure 4-3: CROSSES – CROwd Simulation System for Emergency Situations.

5.0 ROAD MAP AND CONCLUSIONS

For further developments 4 mains M&S actions are identified:

1) Specification of PSO applications.
2) Development of a Reference Scenario Data Model & Reference FOM. The data model and the FOM will be consistent with Peace Support Operation data model for CCIS.
3) Prototype a M&S simulation infrastructure with CCIS-Simulation interfaces for CJTF training and operation planning.
4) Prototype M&S based Counter-terrorism operation support tools.

The 3 first actions are preliminary to a M&S support to PSO demonstrator. The last one is a separate action: different users, different techniques and different simulations.

The SG67 team suggests MSG to support these actions by existing (or new) TAPs. For existing TAP the suggestions could be:

1) MSG-024 “Non-Article V Operations/ Course of Action Analysis Tools” to lead the specification of PSO applications.
2) MSG-018 “Rapid generation of scenario’ to support the development of a reference scenario data model in liaison with eMIP and concerned NATO organisations on CCIS Reference Data Model.
3) MSG-027 “Pathfinder Vision” to support the M&S simulation infrastructure.
4) MSG to set up a Technical Activity Program on Counter-Terrorism operations support tools in liaison with the Exploratory study MSG-ET-005 M&S Tools for the Early Warning and identification of Terrorist Activities.
5) Initiate the development of reference FOM(s) in the PATHFINDER applications and complete the development in the PSO demonstrator in order to take in account the Reference Scenario Data Model for consistency between non-persistent and persistent data model.

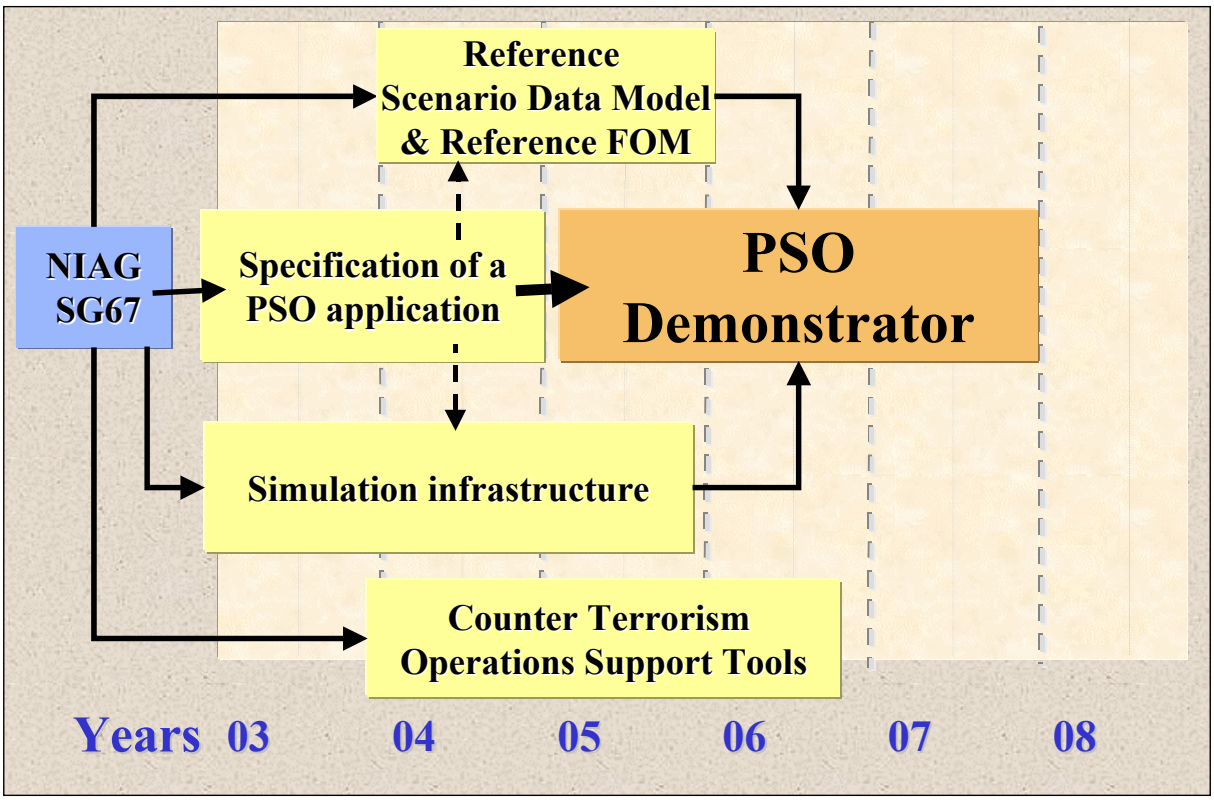

Figure 5-1: Action Plan Road Map.

6.0 ABOUT THE NIAG SG67

The NATO Industry Advising Group – Sub Group 67 is a group of NATO industrial experts in Modelling and Simulation working together on Pre-feasibility study on Modelling & Simulation support to Peace Support Operations. Starting in August 2001 and ending October 2002, the study report and available materials are distributed through the RTO/MSG (sponsor of this study) and NIAG.

Key SG67 positions are:

- Chairman: Jean-Pierre FAYE
- Deputy chairman: Dieter STEINKAMP
- Secretary: Bruno DI MARCO

Full member list, companies and National Points Of Contact are provided below.

Country	Name	Company	POC
BE	Alain HUBRECHT	VRcontext	X
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	Olivier MEYER	EADS/S&DE	
GE	Hans-Jürger MEYER	CAE Elektronik Gmbh	
	Christoph HAMPE	STN-ATLAS (retired)	(X)
	Dieter STEINKAMP	IABG (Previously CCI)	X
	H.J.SCHIRLITZKI	IABG	
IT	Bruno DI MARCO	ALENIA MARCONI Systems	X
	Maurizio SPINONI	ALENIA AERONAUTICA	
SP	Gonzalo F. de la MORA	SENER	
	Frederico CONTRERAS	INDRA	X
UK	Joelle DUMETZ	THALES Training & Simulations	X

Figure 6-1: NIAG SG67 Members.

7.0 REFERENCE DOCUMENTS

[1] AJP-3.4.1. “Peace Support Operations” July 2001 (STANAG 2181).

[2] ATP-3.4.1.1 “Peace Support Operations Tactics, Techniques and Procedures”.

[3] “Force Planning Guide for PSO”.

[4] NATO M&S Master Plan.

[5] Joint Task Force Commander’s Handbook for Peace Operations, Joint Warfighting Center, Virginia, 16 June 1997.

[6] ARTEP 100-23-1 MTP. “Mission Training Plan for the Division Headquarters Command and Staff in Conducting Stability and Support Operations in Bosnia (Peace Support)”, Headquarters, Department of the Army, June 2000.

[7] FM 100-23 “Peace Operations”, Headquarters, Department of the Army, Washington DC, 30 December 1994.

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NIAG Study on Modelling & Simulation support to Peace Support Operations (PSO)

Mr. Jean-Pierre FAYE

NIAG SG67 “PSO”

PARIS, 24 October 2002

AGENDA

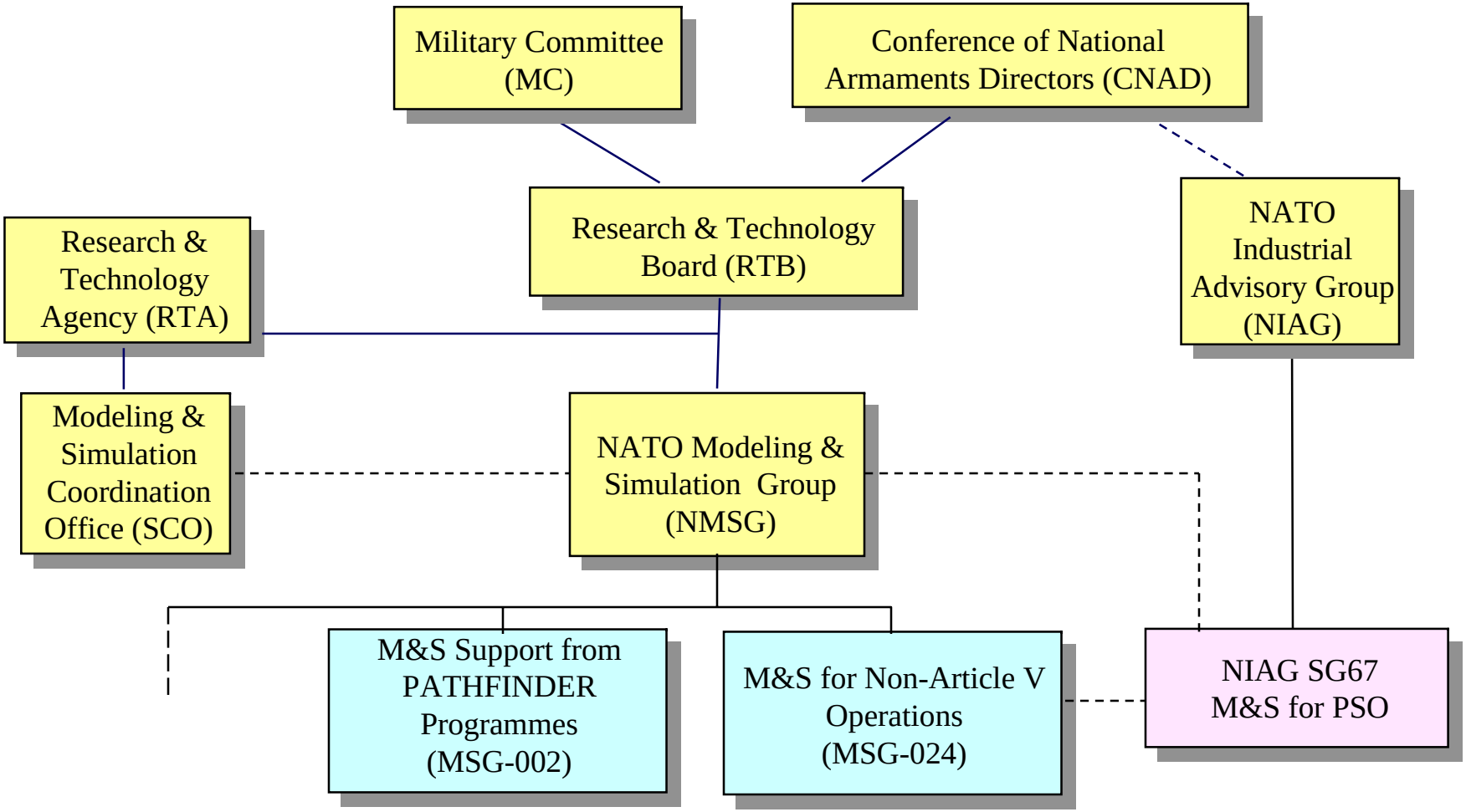
- Introduction
- PSO needs
- State of the art
- Technical Issues
- M&S for Counter terrorism
- Road Map and Conclusion

Study objectives

- **Since early 2000 NMSG has started a M&S support to non-article V activities study (MSG-004/024):**
  - To provide operational requirements.
  - Evaluate the state of the art.
  - Set-up a development plan.

- **NMSG sponsors a 2001 NIAG study supporting the MSG-004 study in order to: *(Term Of Reference)***
  - Specify the technical requirements and NATO CCIS interfaces
  - Set-up a plan to develop a M&S repository
  - Define a PSO demonstrator

NIAG SG67 in the NATO M&S Organisation



Non-Art V & PSO definition

Crisis Response Operation (Non-Art V, OOTW) = PSO + OSI (Other Security Interest)
OSI Example: Counter-Terrorism

Peacekeeping

Peace Enforcement

Conflict Prevention

Peace Support Operations

Peace Building

Peacemaking

Humanitarian Operations

PSO M&S Needs

- **Education**
  - PSO principles, ROEs, International Laws, multinational issues, …
- **Training**
  - E-Learning tools with study cases (Recce, Surveillance, Rescue, command chain with fire/non-fire decision and consequence, patrolling,…)
  - Pre-deployment: force generation, medical resources, administrative needs
- **Exercise**
  - Crisis Management & Planning/Force generation exercises
  - NATO/PfP Joint Combined Exercises in PSO context
  - Tactical training (FTX, CPX, CAX)
    - Cooperation with IO/NGO, CIMIC Training, ROEs
    - Urban Operations
- **Logistic, COA & Planning**
  - Force generation for PSO or Low intensity conflict
  - Support tools for logistic, personnel, medicine
  - Decision aids (Consequences of actions, alternative issues)

Main Reference PSO Documents

NATO documents

- AJP-3.4.1. “Peace Support Operations” July 2001 (STANAG 2181)
- ATP-3.4.1.1 “Peace Support Operations Tactics, Techniques and Procedures”.
- “Force Planning Guide for PSO”.
- NATO M&S Master Plan

US documents

- Joint Task Force Commander’s Handbook for Peace Operations, Joint Warfighting Center, Virginia, 16 June 1997.
- ARTEP 100-23-1 MTP. “Mission Training Plan for the Division Headquarters Command and Staff in Conducting Stability and Support Operations in Bosnia (Peace Support)”, Headquarters, Department of the Army, June 2000
- FM 100-23 “Peace Operations”, Headquarters, Department of the Army, Washington DC, 30 December 1994

PSO Model capabilities req.(1/2)

- **Maritime**
  - Maritime Patrol (Cease-fire line, embargoes, piracy/contraband control, …)
  - Amphibious operations
  - Maritime support (evacuation, logistic, humanitarian resources, counter-mine)
  - Fire support (to forces ashore)
- **Land**
  - Armour (Reconnaissance, surveillance, fire power, protection, mobility, …)
  - Artillery (Fire location radar, UAV, counter-fire, guided munitions)
  - Infantry (site protection, patrol, check points, search ops, riot dispersion, …)
- **Air**
  - Reconnaissance & Surveillance (Fixed-wing, UAV, Satellite; ELINT/SIGINT)
  - Air Transport (Inter-theater & tactical for troops, medical, food, SF, …)
  - Control of the air (Counter-air, air protection, air blockade, traffic control, …)
  - Offensive Air power (high value assets, avoidance of collateral damage, …)
  - Helicopters (Air transport, reconnaissance, combat support)

PSO Model capabilities req.(2/2)

- **Joint logistic**
  - NATO Logistics (accommodation, food, water, petroleum, medical, …)

- **Joint Capabilities**
  - Special Forces (liaison, reconnaissance, …)
  - Engineers (Power supply & distribution, construction, repair, camp construction for forces or refugees, ordnance disposal for mines, …)
    - Note: Environmental constraints
  - NBC (decontamination, recce/survey, terrorist act protection of plants/labs…)
  - Medical (services to forces & indigenous population, hygiene recce, media impacts, veterinary services specially for dogs and for foods)
  - Multinational Specialized Units (Military Police, Military Provost Staff)
  - Intelligence (HUMINT, data collection, night observation, special air surveillance)
  - Psychological operations (use of radio & television newscasts, …)
  - Public affairs (political & diplomatic goals, media, NGO/PVO, …)

Technical Issues

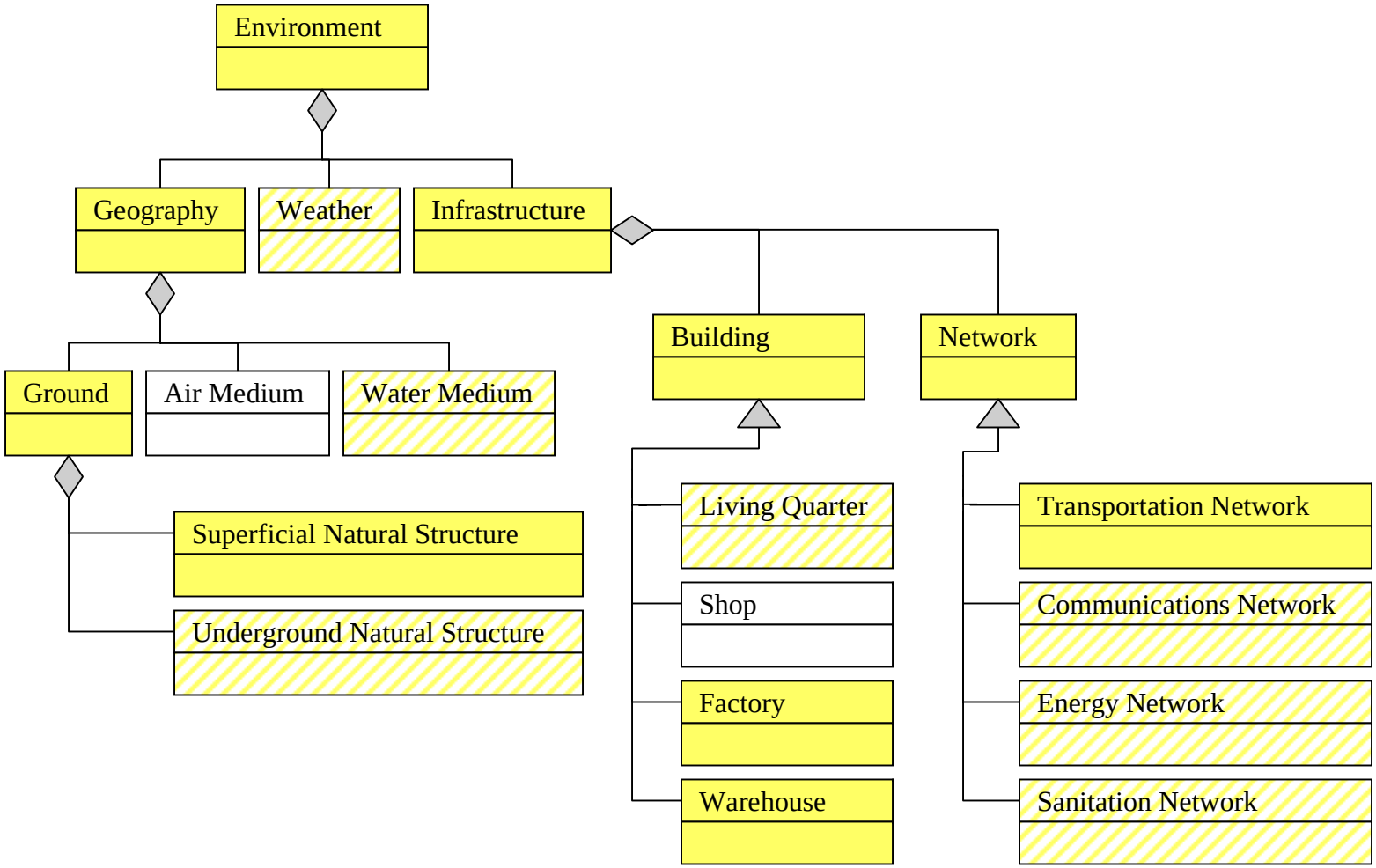
- **Various simulation and tools (Art V & non-Art V)**
  - ➡ Various data models (24 simulation & operational tools analyzed)
- **No one cover all PSO needs**
  - ➡ General purpose Art V with some non-art V capabilities
  - ➡ Specific PSO area (PSYOPS, Urban operations, ….)
- **Lack of common data model**
  - ➡ Various data models
  - ➡ Various level of granularity
- **Lack of CCIS interface (CCIS just starting for PSO)**

Recommendations:

• Design a M&S Common Data Model from LC2IEM V5.0 with extensions for PSYOPS and joint operations

• Extend Legacy Simulation Capabilities and add PSO specific purpose simulation when require to a PATHFINDER federation

Example of required common data model



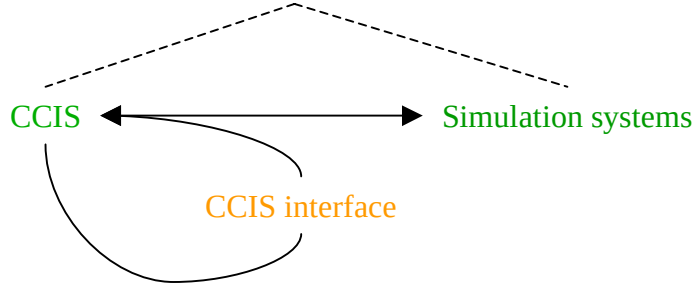
Already covered in most simulations

Partially covered in some specific simulations

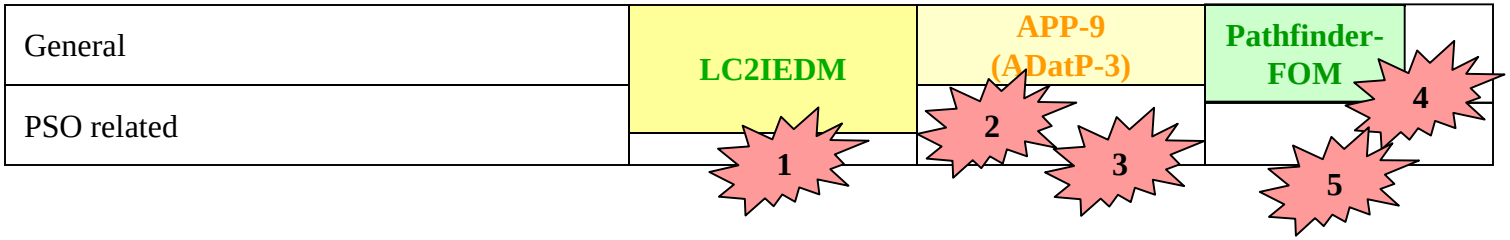
Never covered to our knowledge

Data Modelling Development Process

M&S support to PSO → Use of:

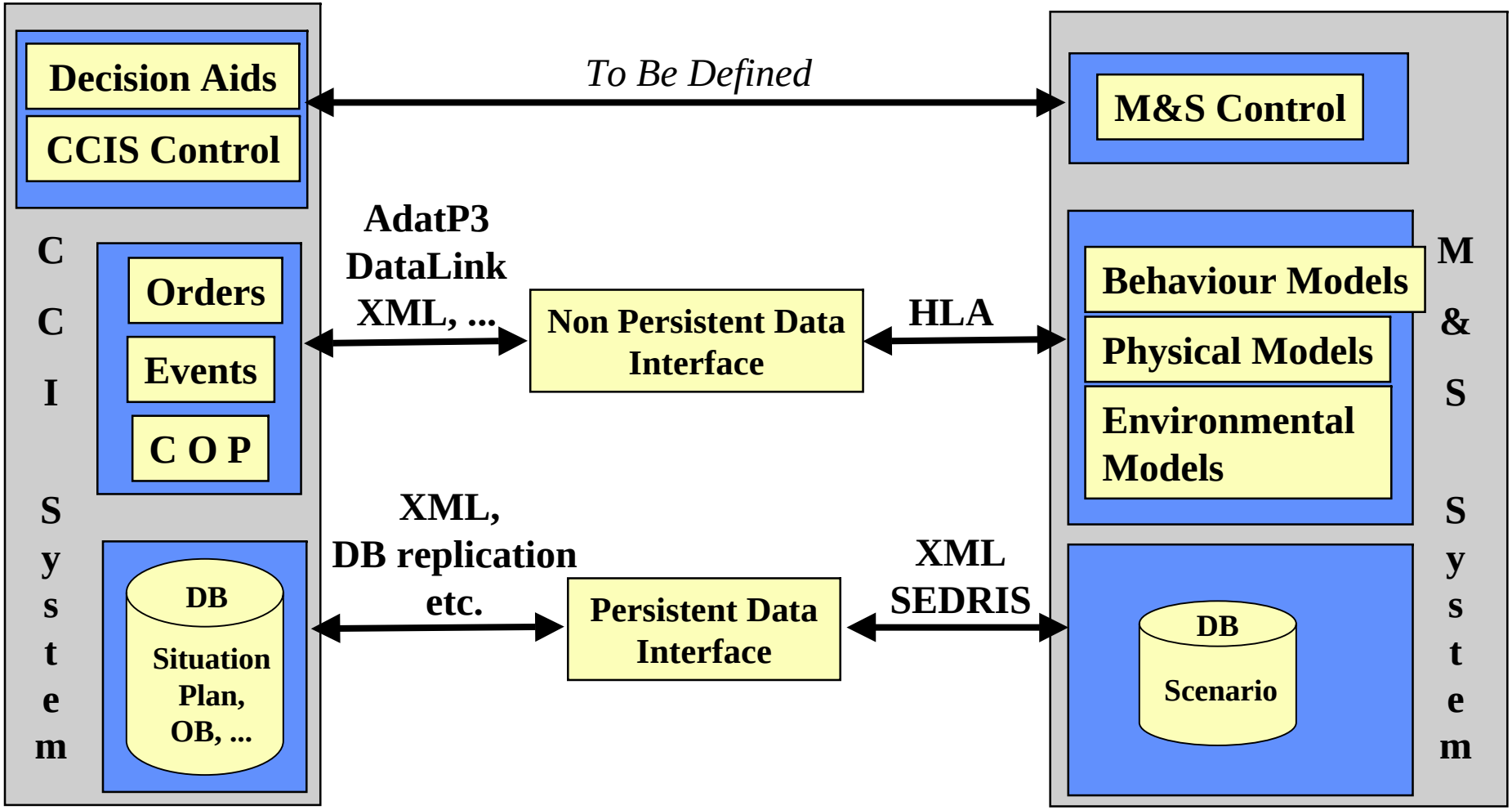


Data standardisation effort

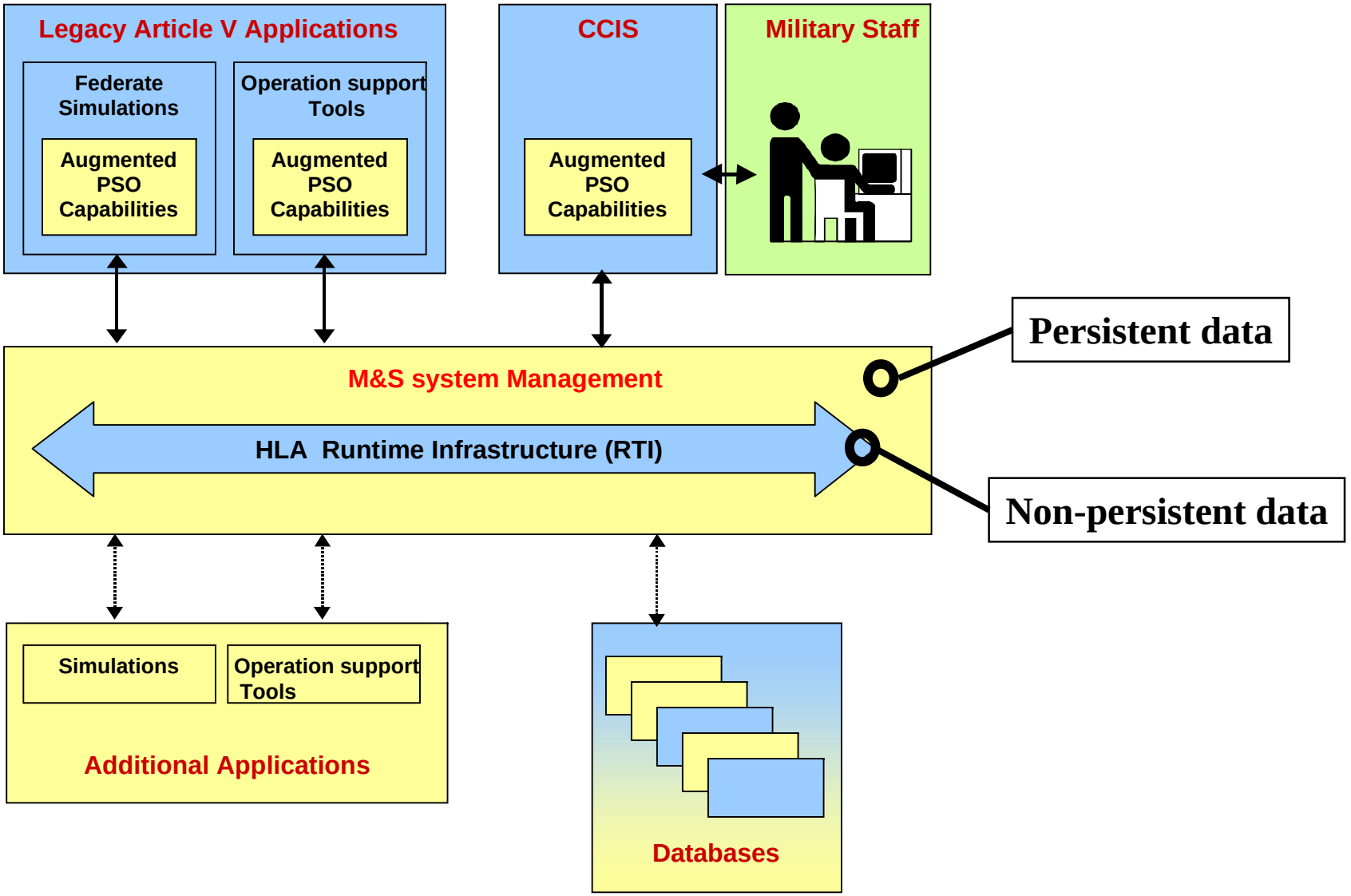


1	Some missing domains - Level of details insufficient for M&S needs	
2	Old message formats - Some are poorly formatted - Not very suitable for exchange with simulations	Some work is done within MIP to exchange data according to the LC2IEDM data model
3	Numerous PSO needs not addressed	
4	No work done except the one starting within PATHFINDER	Problem identified by the SISO organisation - Creation of the C4I Technical Reference Model SubGroup
5	PSO aspects not taken into account	1- Harmonise FOM and CCIS data model 2- Complete the FOM with PSO aspects

Technical Issues for CCIS interface

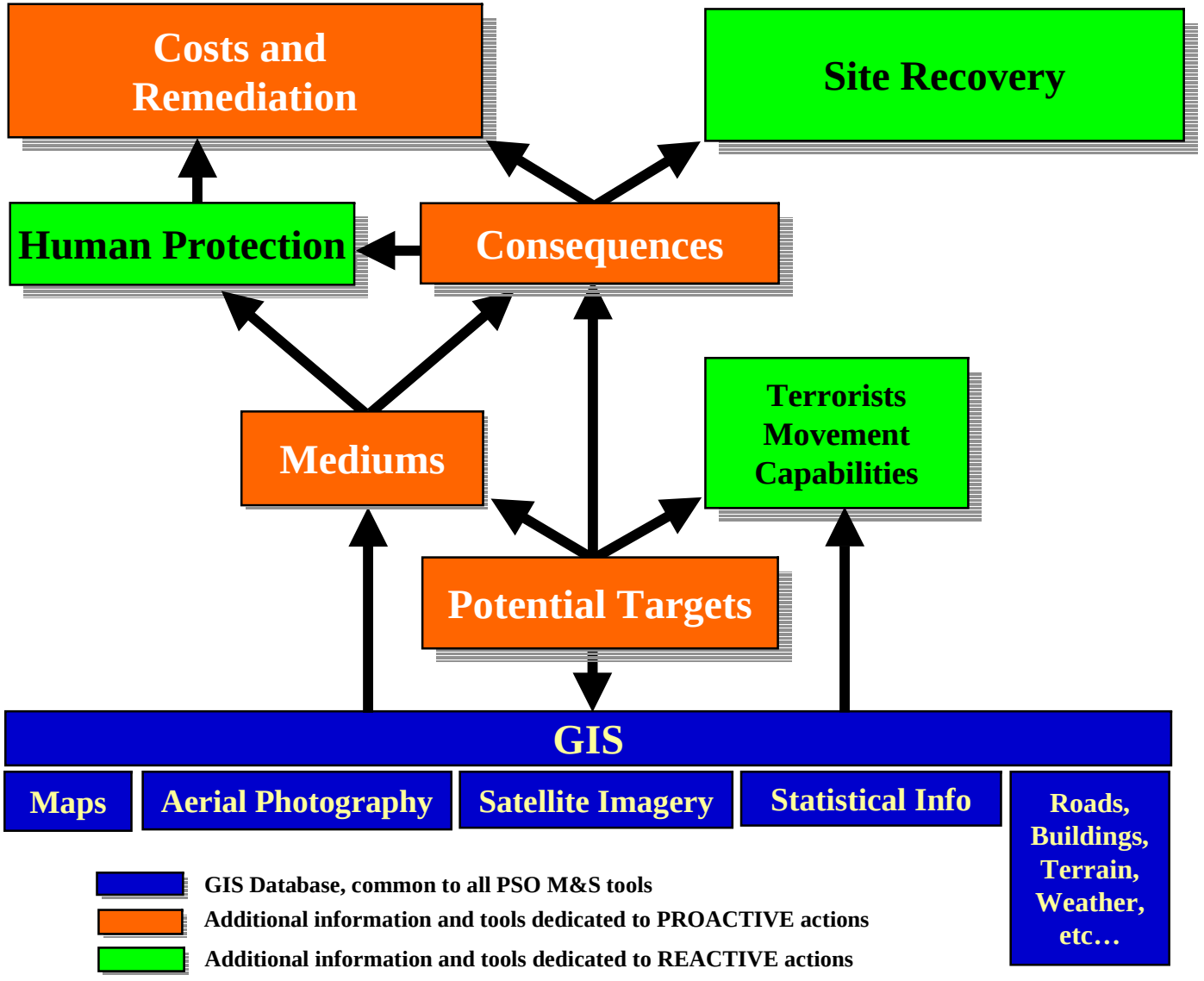


PATHFINDER Vision of M&S for PSO



M&S System for Counter-Terrorism

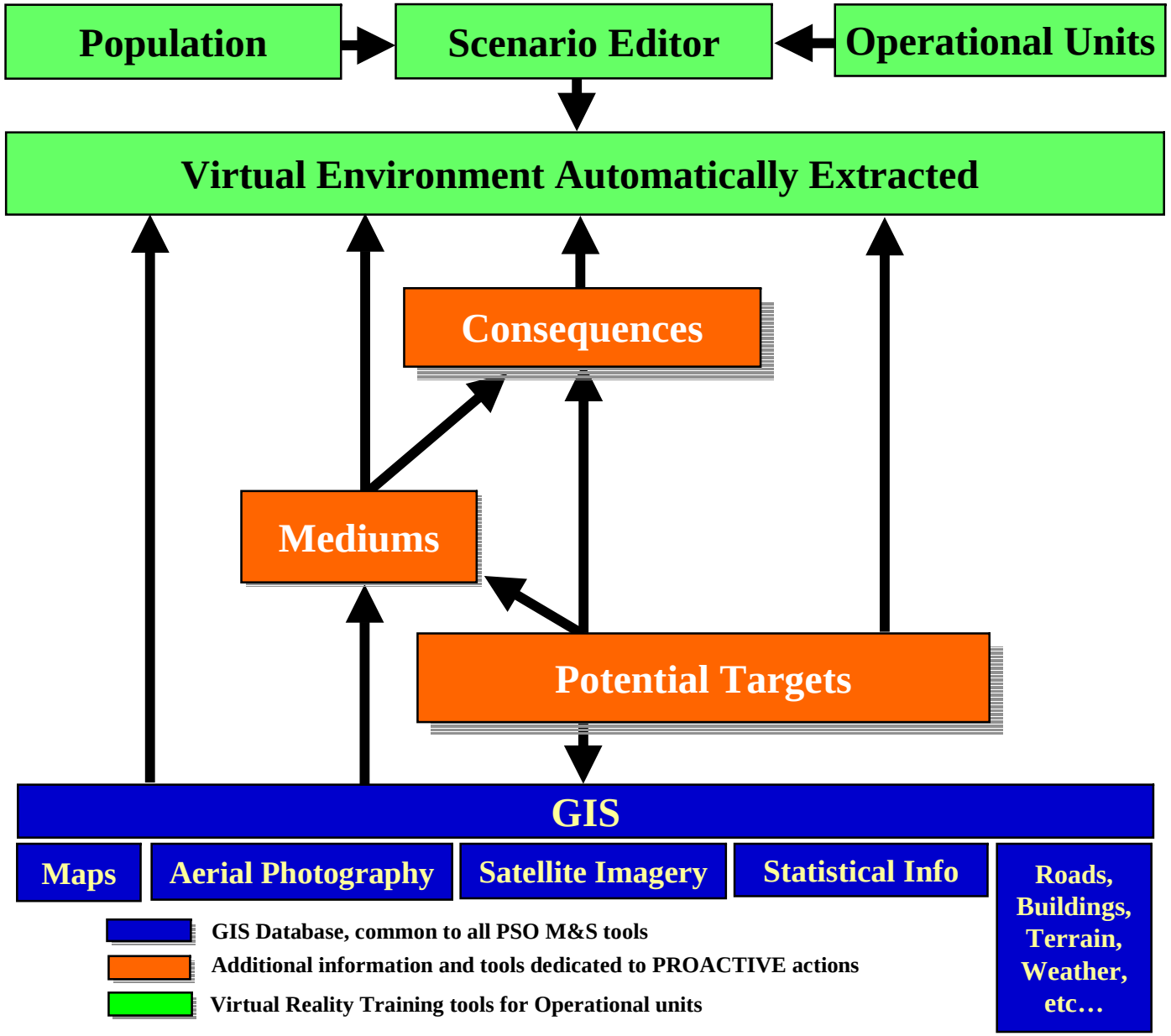
(Out of the PSO scope, but …)



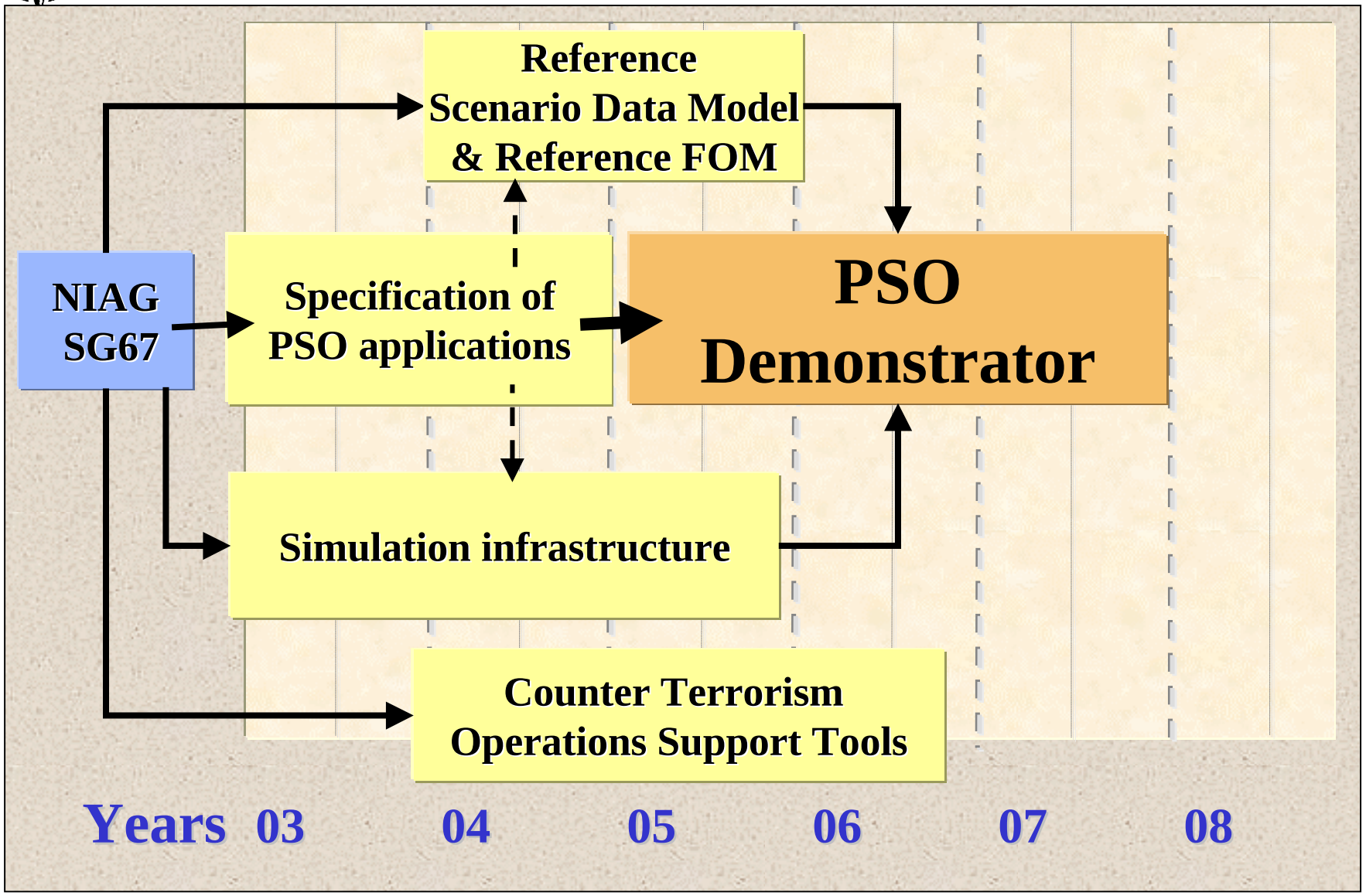
M&S for Counter-Terrorism

Sandia National Laboratories
Weapons of Mass Destruction Decision Analysis Center

Training Version



Action plan & Road Map



Implementation of the action plan

- **Recommendation to support this action plan through existing MSG Technical Activity Programs:**
  - **Specification of a PSO application** : **MSG-024** Non-Article V / Course of Action Analysis Tools
  - **Simulation infrastructure** : **MSG-027** PATHFINDER "Vision"
  - **Reference scenario : MSG-018** Rapid generation of scenario
  - **Reference FOM:** Initiate reference FOM through Pathfinder application, complete with the PSO demonstrator.
  - **Counter Terrorism Operations Support Tools:** Following action to the Exploratory study **MSG-ET-005** M&S Tools for the Early Warning and identification of Terrorist Activities

NIAG SG67 Organization

- **Key positions:**
  - **Chairman:** Jean-Pierre FAYE (FR)
  - **Deputy Chairman:** D.STEINKAMP (GE)
  - **Secretary:** Bruno DI MARCO (IT)
- **Members**

Country	Name	Company	POC
BE	Alain HUBRECHT	VRcontext	X
CZ	Martin KLICNAR	VR Group	X
FR	Jean-Pierre FAYE	ThalesRaytheonSystems	X
	Olivier MEYER	EADS/S&DE	
GE	Hans-Jürger MEYER	CAE Elektronik Gmbh	
	Christoph HAMPE	STN-ATLAS (retired)	(X)
	Dieter STEINKAMP	IABG (Previously CCI)	X
	H.J.SCHIRLITZKI	IABG	
IT	Bruno DI MARCO	ALENIA MARCONI Systems	X
	Maurizio SPINONI	ALENIA AERONAUTICA	
SP	Gonzalo F.de la MORA	SENER	
	Frederico CONTRERAS	INDRA	X
UK	Joelle DUMETZ	THALES Training & Simulations	X